



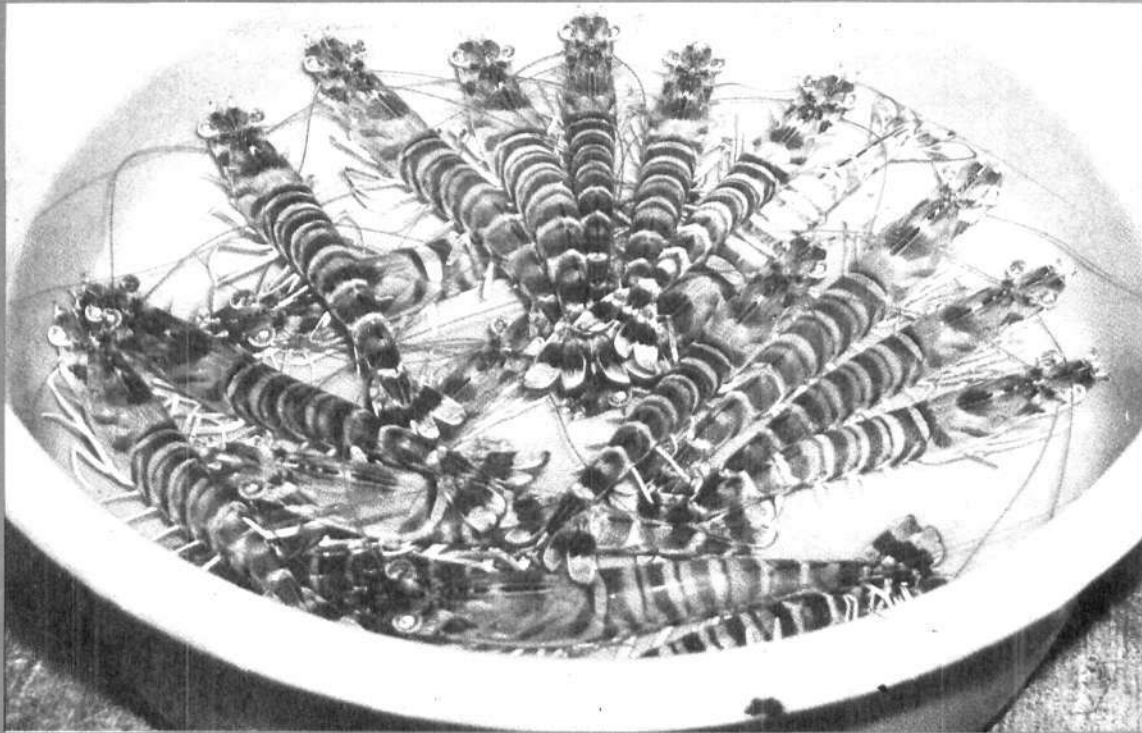
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**822 GROWTH AND SURVIVAL OF THE INDIAN PEARL OYSTER
(PINCTADA FUCATA) IN KAKINADA BAY**

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Kakinada Bay which has a total spread of 146 sq.km. area has diverse molluscan resources, especially bivalves and gastropods. Several workers have studied in detail, the molluscan resources of the Bay and their fishery characteristics. The Bay also harbours a population of resident pearl oyster, *Pinctada chemnitzii* towards its eastern side near Hope Island. But *Pinctada fucata* is an exogenous species as far as Kakinada Bay is concerned. There is no information about the adaptability of this species to the Bay condition and their suitability for year round culture operation, which is one of the major prerequisites for taking up pearl culture in the Bay and adjacent areas. Therefore an attempt was made to rear *P. fucata* spat to operative size com-

pletely in Kakinada Bay to assess the suitability of the Bay for their commercial culture operations.

Spat : Spat of the Indian Pearl oyster *Pinctada fucata* of size ranging from 7.0 to 21.6 mm DVM (Dorsoventral measurement) (average 14.58 mm) brought from Tuticorin hatchery were used for the trial.

Mode of transport : The spat were transported in oxygen filled double layered polythene bags containing 9 litres of chilled seawater. In each bag 1,000 spat were transported. They were arranged in a two tier system, each tier having 500 seed. The bags were then placed in insulated tin containers. On reaching Kakinada after 44

hours of transport all the spat were found in good condition without any mortality.

Growth trial : Velon screen bags placed inside the cages were used to rear the spat. The cages were suspended from the fisheries harbour jetty at a minimum depth of about 75 cm below the water surface. Spacers were used to keep opposite walls of the bag apart. This helped in minimising mesh clogging to a certain extent. When the spat reached 20-25 mm size, they were freed into the cages for further rearing.

Growth and mortality of the pearl oysters and hydrographic parameters of the site were monitored at regular intervals. Oysters and culture structures were cleared off from foulers, borers and predators periodically. The study was conducted during August, 1996 - March, 1997.

Hydrography : Salinity, temperature and clarity of the water at the site were recorded regularly to ascertain their effect on the growth and survival of the oysters. The water transparency was low throughout the period indicating high productivity. The suspended silt particles resulting from dredging operations in the Bay, port construction work and continuous movements of the fishing vessels caused turbidity in the Bay.

Salinity and water temperature fluctuated very widely during the course of study (Fig.1).

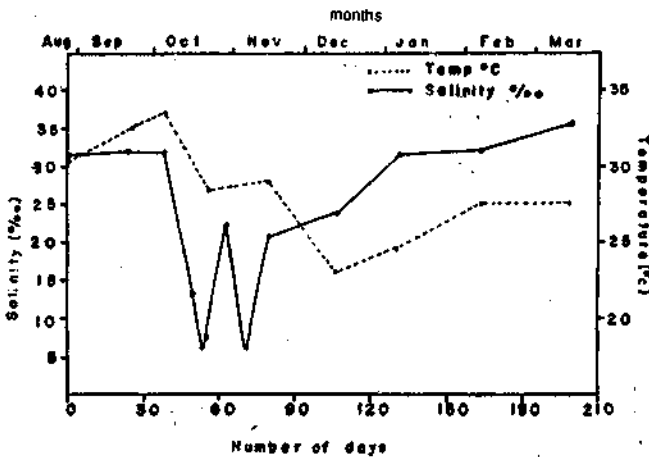


Fig. 1. Water temperature and salinity fluctuations in Kakinada Bay during August 1996 to March-1997 period.

Salinity dropped to as low as 6.16 % in October and November following heavy cyclonic rains and floods. However, the low salinity conditions lasted

only for short periods in both months. After December salinity gradually increased and reached 32.6 % by March.

Water temperature at the site varied between 23.0 and 33.5°C. Temperature was the lowest during December and high in October.

Growth : The pearl oysters exhibited good growth throughout the culture period except from October to December (Fig. 2). The oysters

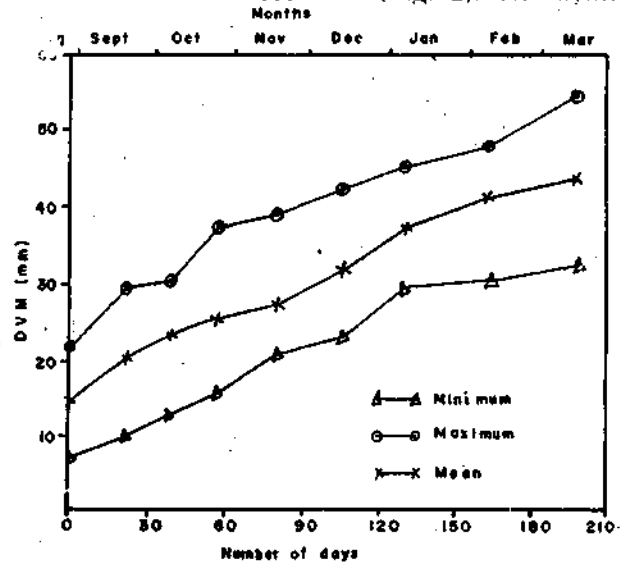


Fig. 2. Growth of the pearl oyster, *Pinctada fucata* in Kakinada Bay.

grew to an average size of 43.8 mm in DVM with sizes ranging between 31.50 and 55.00 mm by March, 1997. Monthly growth rate ranged between 2.34 and 6.07 mm in DVM. They attained an average weight of 12.0 g and thickness of 10.0 to 17.4 mm by March (Fig. 3). When compared to

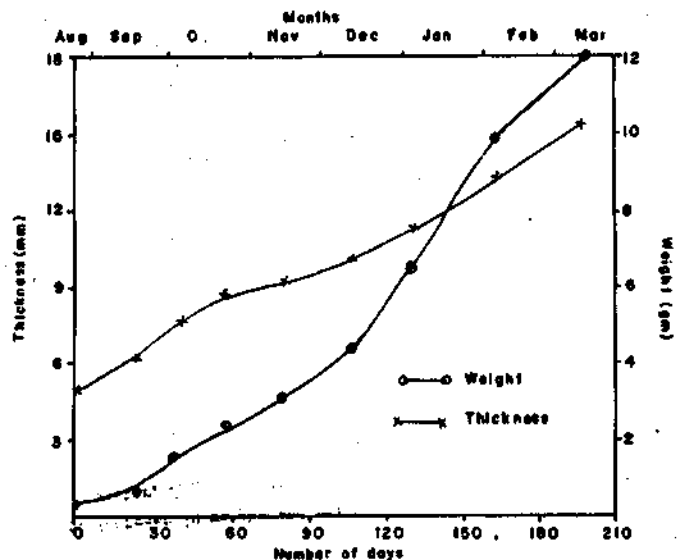


Fig. 3. Increase in weight and thickness of the pearl oyster, *Pinctada fucata*.

the dorsoventral growth, the increase in weight and thickness was slow during the early growth stages. But once the oyster reached 40-45 mm size, the dorsoventral growth slowed down while the thickness and weight increased rapidly.

The slow growth of the oysters during October-December period was due to low water temperature and salinity existed in the Bay during that period.

Survival : The rate of survival was 83.1%. Mortality was minimum throughout the rearing period. Comparatively higher rate of mortality was noticed at the time of low water temperature and salinity, during October-December period.

Settlement of fouling and boring organisms : Sessile organisms such as barnacles, oysters, mussels, sponges and polychaetes settled over the oysters and cages throughout the period. Peak settlement was observed from January to March when the salinity was on the rise.

Remarks

Despite many adverse conditions like cyclonic storms and floods, fluctuating salinity, heavy silt load and high turbidity, the growth and survival of the pearl oyster was comparatively high in the Kakinada Bay. This was primarily due to

high productivity. Though the salinity fluctuation in the Bay is very high, the low salinity conditions did not continue for long periods due to the wide bar mouth and tidal influence. The variation in salinity did not have much adverse effect on the survival of the oysters.

The present work clearly indicates that the pearl oyster, *Pinctada fucata* can be grown throughout the year in the Kakinada Bay, if protection from cyclonic storms and waves was provided. The Hope Island in combination with the newly constructed 1,500 m, long breakwater wall will provide enough protection to the Bay. However, under the prevailing conditions the Bay is not suitable for raft culture operation. The present observations suggested that rack and tray and or cage culture techniques can be adopted successfully for raising pearl oyster stock for commercial operations. Assessment of pearl production and its quality in Kakinada Bay conditions has also to be undertaken.

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